

ABSTRACT

The invention includes improvements in the method and apparatus of handling and storing dry materials in storage vessels. Among the many improvements of the storage vessel is a fluidized bed that is fabricated with one or more fixed zones to fluidize the dry powder-like material that is stored directly on and above each zone. Each zone, or compartment of the fluidized bed, will be pressurized independent of the other zones with high-volume, low-pressure air in a specific sequence, via a simple air distribution device, to ensure that the contents in the vessel is accurately discharged on a first-in, first-out basis. In addition to the controlled discharge method using a zoned, fluidized bed, the silo may also be equipped with an oversized, filter-vent top to more efficiently filter the material and air as they are conveyed and filled in the silo. The oversized, filter-vent top may be large enough to eliminate the use of a dust collector that is generally used with these types of bulk handling systems. Other improvements include a flexible and smooth (seamless) interior wall surface, the use of inexpensive, commodity type (carbon-steel) wall panels, easily accessible inspection and clean-out ports and a quick-change method and device for removing and or replacing the zoned, fluidized bed assembly.